

32. (Once Amended) The method of claim 30, wherein the inertial force is linear, the movement is bi-directional with respect to the housing, the movement being associated with the linear inertial force.

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33. (Once Amended) The method of claim 30, wherein the mechanism includes a flexure having at least two flex joints.

#### REMARKS

Claims 8 and 17 have been cancelled. Claims 1-7, 9-16 and 18-33 have been amended. Accordingly, claims 1-7, 9-16 and 18-33 are pending in this application. Applicants respectfully submit that no new matter has been added. Entry and consideration of the foregoing amendments is respectfully requested.

Should the Examiner have any questions or comments concerning the above-identified amendment, please feel free to contact the undersigned at the phone number listed below.

The Commissioner is hereby authorized to charge any appropriate fees under 37 C.F.R. §§1.16, 1.17, and 1.21 that may be required by this paper, and to credit any overpayment, to Deposit Account No. 50-1283.

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## APPENDIX

MARKED-UP VERSION OF CLAIMS

1. A haptic feedback interface device in communication with a host computer implementing a host application program, said interface device manipulated by a user, the interface device An apparatus, comprising:

a device housing that is physically contacted by said user;

a sensor device detecting saidcoupled to the housing, the sensor configured to detect a manipulation of said interface device by said user, said sensor device outputting at least a portion of the housing and to output sensor signals representativeassociated with the manipulation of said manipulation the portion of the housing;

an actuator coupled to said device housing, saidthe housing, the actuator operative to output a configured to output a force; and a associated with the sensor signals; and

a first flex joint mechanism coupling saidand a second flex joint each being coupled to the housing and the actuator-to-said device housing, saidthe first flex joint and the second flex joint mechanism allowing saidconfigured to transfer the force output from the actuator to be moved with respect to said device housing, wherein said actuator acts as an inertial mass when in motion to provide an inertial force that is transmitted to said user, wherein said mechanism includes at least two separated portions, each of said portions coupled to a different portion of said actuator the housing to produce a haptic feedback.

2. A haptic feedback interface device as recited in claim 1 where said actuator The apparatus of claim 1, wherein the force is a rotary force.

3. A haptic feedback interface device as recited in The apparatus of claim 2, wherein onethe first flex jointofsaidseparate portions ofsaidmechanism is coupled to a rotating shaft of saidthe actuator, and anotherthe second flex jointofsaidportions is coupled to a housingportion of saidthe actuator excluding the rotating shaft.

4. A haptic feedback interface device as recited in The apparatus of claim 1, wherein said the force output by the actuator is associated with an approximately linearly linear moved motion with respect to said device the housing to provide, the haptic feedback having a linear inertial force, said movement caused by said force output by said direction associated with the linear motion of the actuator.

5. A haptic feedback interface device as recited in The apparatus of claim 1, wherein said the housing includes a substantially flat base configured to be in contact with a support surface, the movement of the actuator approximately linearly moves approximately along a z-axis being substantially perpendicular to an x-y plane in which said user can move a manipulandum the substantially flat base of said interface device the housing.

6. A haptic feedback interface device as recited in The apparatus of claim 1, wherein said actuator is coupled to the housing includes a contact member such that when said actuator is moved configured to be contacted by a user, said the contact member is moved, wherein said user physically contacts said contact member in normal operation of said interface device, said contact member transmitting a contact force being coupled to the actuator and configured to said user while said transmit the inertial force is transmitted to said the user.

7. A haptic feedback interface device as recited in The apparatus of claim 6, wherein said the contact member includes a cover portion of said interface device, said cover portion being at least a portion of a top surface of said interface device the housing.

9. A haptic feedback interface device as recited in The apparatus of claim 8, wherein one of said portions of said the first flex joint flexure includes a rotating member coupled to said the housing by at the first flex joint.

10. A haptic feedback interface device as recited in The apparatus of claim 9, wherein one of said portions of said the first flex joint flexure includes a collar coupled to a

~~housing of said the actuator and a, the first flex joint couples coupling said the collar to said the housing.~~

11. A haptic feedback interface device as recited in The apparatus of claim 1, wherein ~~said the actuator includes a rotating shaft having a range of motion, the first flex joint flexure includes at least one stop to prevent rotation disposed within the range of a motion of rotating shaft of said actuator past a desired fraction of a full revolution.~~

12. A haptic feedback interface device as recited in claim 1 wherein ~~said The apparatus of claim 1, wherein the actuator is moved configured to move with a bi-directionally to produce pulse and vibration sensations to said user. directional action, the force output from the actuator being associated with the bi-directional motion.~~

13. A haptic feedback interface device as recited in The apparatus of claim 11, wherein ~~said interface device the housing is included within a handheld interface device.~~

14. A haptic feedback interface device as recited in The apparatus of claim 11, wherein ~~said interface device the housing is included within a mouse.~~

15. ~~A The apparatus of claim 14, wherein the haptic feedback interface device as recited in claim 14 wherein said inertial force is correlated configured to be associated with a graphical representation displayed by said a host computer, wherein a position of said mouse in said planar workspace corresponds with a position of a cursor displayed in said graphical representation.~~

16. A haptic feedback interface device as recited in The apparatus of claim 11, further comprising a microprocessor, separate from said host computer, coupled to ~~said the~~ sensor and to ~~said the~~ actuator, ~~said the~~ microprocessor operative ~~configured~~ to receive host commands from ~~said a~~ host computer and sensor signals from the sensor, output force signals to ~~said the~~ actuator for controlling ~~said inertial force, associated with the haptic feedback and operative to receive~~

~~said sensor signals from said sensors, process said sensor signals, and report locative data to said host computer derived from said sensor signals and indicative of manipulation of said interface device.~~

18. ~~A haptic feedback interface device in communication with a host computer implementing a host application program, said interface device manipulated by a user, the interface device~~An apparatus, comprising:

~~a device housing that is physically contacted by said user;~~  
~~a sensor device detecting saidcoupled to the housing, the sensor configured to detect a manipulation of said interface device by said user, said sensor device outputtingat least a portion of the housing and to output sensor signals representative of saidassociated with the manipulation of the portion of the housing;~~ and

~~an actuator assembly coupled to said device housing, said actuator assembly comprising: an actuator; and a flexure coupling saidan actuator to said devieassembly coupled to the housing, said flexure allowing saidthe actuator to be moved with respect to said device housing, wherein saidassembly including an actuator acts as an inertial mass when in motion to provide an inertial force that is transmitted to said user a first flex joint and a second flex joint, wherein said flexure includes at least two separate portions, each of said portions coupled to saideach being coupled to the actuator, and each of said portions including at least one flex joint, the actuator being configured to output an inertial force to the housing, the first flex joint and the second flex joint being configured to allow a movement of the actuator with respect to the housing.~~

19. ~~A haptic feedback interface device as recited in~~The apparatus of claim 1818, wherein ~~saidthe inertial~~ force output by said actuator is a rotary force, wherein ~~one~~the first flex joint of said separate portions of said mechanism is coupled to a rotating shaft of ~~saidthe~~ actuator, and another of said portions~~the second flex joint~~ is coupled to a ~~housing~~remaining portion of ~~saidthe~~ actuator.

20. ~~A haptic feedback interface device as recited in~~The apparatus of claim 1818, wherein ~~saidthe movement of the~~ actuator is approximately linearly movedlinear with respect to

~~said device~~the housing to provide a linear, ~~the~~ inertial force, ~~said~~ movement caused by ~~said~~ force output by ~~said~~the actuator is approximately linear.

21. A haptic feedback interface device as recited in The apparatus of claim 1818, wherein ~~one~~the first flex joint of ~~said~~ portions of ~~said~~ flexure includes a rotating member coupled to ~~said~~the housing by a flex joint.

22. A haptic feedback interface device as recited in The apparatus of claim 2121, wherein ~~one~~ of ~~said~~ portions of ~~said~~the second flex joint flexure includes a collar coupled to a housing of ~~said~~the actuator and a flex joint coupling ~~said~~ collar to ~~said~~ housing.

23. An actuator assembly for providing inertial sensations in a haptic feedback interface device, the actuator assembly comprising:

an actuator, the actuator being configured to output haptic feedback; and  
a flexure mechanism coupling ~~said~~the actuator to ~~said~~ devicea housing, ~~said~~the flexure allowingmechanism being ~~said~~configured to allow a movement of the actuator to be moved with respect to ~~said device~~the housing, ~~wherein~~ ~~said~~ actuator ~~is operative to act as an inertial mass~~ ~~when in motion to provide an inertial force that is transmitted to a user of~~ ~~said haptic feedback~~ interface device, ~~wherein~~ ~~said~~the flexure includes at least two separate portionsmechanism having a first portion and a second portion, each of ~~said~~ portionsbeing coupled to ~~said~~the actuator; and each of ~~said~~ portions including at least one flex joint.

24. A The actuator assembly of claim 23, wherein the haptic feedback interface device as recited in claim 23 wherein ~~said~~ force output by ~~said~~ actuator is associated with a rotary force.

25. A haptic feedback interface device as recited in claim 24 The actuator assembly of claim 24, wherein ~~one~~the first portion of ~~said~~ separate portions of ~~said~~ mechanismthe flexure mechanism is coupled to a rotating shaft of ~~said~~the actuator, and anotherthe second portion of ~~said~~the portionsflexure mechanism is coupled to a ~~housing~~the remaining portion of ~~said~~the actuator.

26. A haptic feedback interface device as recited in claim 23 The actuator assembly of claim 23, wherein said the movement of the actuator is approximately linearly moved linear with respect to said device the housing to provide a linear, the inertial force, said movement caused by said force output by said the actuator is linear.

27. A haptic feedback interface device as recited in claim 23 The actuator assembly of claim 23, wherein one the first portion of said portions of said flexure the flexure mechanism includes a rotating member coupled to said the housing by a one of the at least one flex joint joints.

28. A haptic feedback interface device as recited in claim 28 The actuator assembly of claim 23, wherein one the first portion of said portions of said flexure the flexure mechanism includes a collar coupled to a housing of said the actuator and a flex joint coupling said the collar to said the housing.

29. A haptic feedback interface device as recited in claim 24 The actuator assembly of claim 24, wherein said the actuator is moved configured to move with a bi-directionally directional motion, the force output from the actuator being associated with the bi-directional motion to produce pulse and vibration sensations to said user haptic feedback.

30. A method for providing inertial haptic sensations using a haptic feedback interface device in communication with a host computer, said interface device manipulated by a user, the method comprising:

enabling detecting a detection of said manipulation of said interface device by said user, said sensor device outputting;

sending sensor signals representative of said associated with the manipulation; and

enabling an output of a force with actuator; and

causing said outputting an inertial force by a movement of an actuator to be moved with respect to said device a housing using of the device, a mechanism coupled between said actuator and a device housing, wherein said actuator acts as an inertial mass when in motion to provide an

~~inertial force that is transmitted to said user, wherein said mechanism includes~~including at least two ~~separated~~separate portions, each of said portions ~~being~~ coupled to a different portion of ~~said~~point on the actuator ~~and the housing~~.

31. ~~A~~The method as recited in of claim 3030, wherein ~~said~~the inertial force output by ~~said~~the actuator is a rotary force.

32. ~~A~~The method as recited in of claim 3030, wherein ~~said~~actuator~~the~~ inertial force is approximately linearly moved ~~linear, the movement is~~ bi-directionally ~~directional~~ with respect to ~~said device~~the housing to provide a, ~~the movement being associated with the~~ linear inertial force, ~~said movement caused by~~ ~~said force output by~~ ~~said actuator~~.

33. ~~A~~The method as recited in of claim 3030, wherein ~~said~~the mechanism includes a flexure having at least two flex joints.